of the neural plate. The "Zwischenstrang" of His has no share in the formation of the ganglia, and the "Zwischenrinne" of the same anatomist has no existence. After separation from the epiblast, the neural cranial ganglia and the spinal ganglia are carried up with the closing in of the neural tube, and come to lie between its lips, but are quite distinct from the central nervous system. The neural cranial ganglia grow towards the lateral epiblast at the level of the notochord and fuse with it. In addition to the four elements of the anterior and posterior roots, two ganglionated and sensory, two motor and unganglionated, the cranial nerves contain a fifth element, derived from the lateral or branchial sense organs. Beard confirms the opinion of Balfour respecting the origin of the anterior roots of cranial and spinal nerves. F. T.

Sur la persistance de l'aptitude régénératrice des nerfs. C. VOULAIR. Bull. de l'Acad. d. Sc. de Belge [3], XVI, 7, p. 93.

The author cut the sciatic nerve in dogs and obtained the usual regeneration. Hoping to get this a second time in the same dog, he again cut the nerve, but without the desired result. The failure of the tissue to renew itself a second time in this case he attributes to the disturbance of the circulation, etc., following the operation, and to the resistance which the peripheral connective tissue offers to the proliferation. On the other hand, he did obtain regeneration for the second time in the poplitaeus internus of the dog, and concludes, from two successful experiments, that the same nerve may regenerate itself at least twice, perhaps more often.

Ueber die centrale Endigung des Nervus opticus bei den Vertebraten. J. BELLONCI. Mit 8 Taf. u. 4 Holzsch. Zeitschr. f. Wissen. Zool., B. 47, H. 1, 1888.

During the past ten years Bellonci has published a number of papers on the finer anatomy of the central nervous system, and his work has been for the most part comparative. All this gives him facility in handling a complicated problem like the one indicated in his title. He has worked over the optic centers and nerves in the reptiles and batrachia, the teleost fish, the birds, and the mammals, thus obtaining four types for comparison. The method which was most successful was a staining and hardening in osmic acid, followed by clearing the section with ammonia. The effect of this treatment was to leave visible only the fibers stained with osmic, the remainder of the section becoming completely transparent. Most of the numerous figures accompanying the paper are made from such specimens, and certainly show the fibers with great clearness. The disadvantage of the method is that only small pieces of tissue can be used, and therefore the brains employed must always be of small size. The plan of the investigation is an analysis of the fiber systems found in the optic tract and the adjoining regions, and a following of each of these to its termination. In pursuing such a plan much detailed description is required, which it is of course impossible to summarize. The optic fibers proper are traced to their destination by the study of serial sections in several planes. This method leads to the general conclusion that all optic fibers end in the corpora optica, the homologues in the vertebrate series of the corpora quadrigemina anteriora in man. The fibers coursing

through the geniculate bodies and thalamus, according to Bellonci, give off at most fine branches to the cells of these parts, but do not lose their identity, whereas when the fibers reach the corpus opticum they branch, forming a profuse network, and there really terminate. The criterion of termination is then, for Bellonci, the formation of a fine network and the consequent loss of identity.

At first sight these results appear quite revolutionary, but it is not impossible to harmonize them with the current views based on other methods. The author, however, recognizes that his work bears on the problem from but a single stand-point, and that the true conclusion can be reached only after the matter has been tested from every side. The structure of the corpus opticum is fundamentally similar in all the types.

A nucleus of varying value and position, sometimes covered by the corpus opticum and sometimes exposed, forms his corpus posterius, which he clearly shows to be the homologue of the corpus quadrigeminum posterius in man. The commissura posterior of v. Gudden appears to end here after passing through the internal geniculate body, into connection with which some authors have previously brought it. The optic region in the birds was found to conform with the type shown in the teleosts rather than with that found in the reptiles and batrachia. In no case is any mention made of an uncrossed bundle of fibers in the optic tract such as exists in the higher mammals. This negative point is of interest, since the method used was well fitted to demonstrate the bundle if it was present in the small mammals—mouse, rat, guinea-pig, etc., which were studied. The manuscript and plates were completed in 1885, but for some unexplained reason have been delayed in publication.

Beiträge zur Kenntniss der Sehnervenkreuzung. J. SINGER und E. MÜNZER. Denkschr. d. Mathematisch-Naturwissensch. Classe d. Kais. Akad. d. Wissensch. zu Wien, Bd. LV, S. 163, 1888. Abstract by Steinach, Centralbl. f. Physiologie, No. 25, März, 1889.

Michel's paper (Festschrift zum 70 Geburtstage Kölliker's, Würzburg, 1887) has recently reopened the discussion on the partial decussation of the optic fibers. The authors have again taken up the problem, and by the aid of a new method, first described by Marchi and Algeri, have obtained some important results. The point of the method consists in treating small pieces of the tissue, in the early stages of Wallerian degeneration, first with Müller's fluid and then with a mixture of Müller's and osmic, with the result of tinging the normal nerve fibers light brown, whereas those undergoing degeneration appear intensely black. The course of the optic fibers was studied in the pigeon, owl, guinea-pig, white mouse, rabbit, dog and cat, the procedure being to enucleate one eye, kill the animal at the end of two or three weeks, and then study sections of the optic fibers through their entire course. It appears that the decussation is a total one in the pigeon, owl, white mouse and guinea-pig (a result quite in agreement with that of Bellonci noted above), while in the rabbit, dog and cat it is partial, the uncrossed bundle increasing in size in these animals in the order in which they are named. They further show that the uncrossed fibers do not normally form a bundle, but are scattered among the others. When,